

LISTING OF CLAIMS

1(previously presented). A method for dispensing a foam comprising:

(a) combining at least one epoxy component, at least one acid source component, wherein said at least one acid source component comprises at least one hydrogen donating Lewis acid that is substantially water free, and at least one encapsulated blowing agent, under conditions sufficient to cause an exothermic reaction between said at least one liquid epoxy and at least one Lewis acid during said combining wherein an amount of heat is generated from said exothermic reaction that is sufficient to expand the combined components;

(b) utilizing heat from the exothermic reaction to expand the combined component, and;

(c) dispensing a foam into a cavity.

2(previously presented). The method of Claim 1 wherein the encapsulated blowing agent is combined with said at least Lewis acid prior to contact with said at least one epoxy component.

3(previously presented). The method according to Claim 1 wherein said at least one acid source comprises phosphoric acid that comprises less than about five weight percent water.

4(previously presented). The method according to Claim 1 wherein the epoxy component is present in a first precursor composition and the acid source is present in a second precursor composition wherein said second precursor composition has an acidic pH.

5(previously presented). The method according to Claim 1 wherein the at least one encapsulated blowing agent comprises at least one member selected from the group consisting of butane, propane, isopentane and fluorocarbons.

6(previously presented). The method according to Claim 4 wherein the second precursor composition further comprises polyvinyl alcohol.

7(previously presented). The method according to Claim 1 wherein the encapsulated blowing agent is combined with said at least one epoxy component prior to contact with said at least one Lewis acid.

8(previously presented). The method according to Claim 1 wherein said cavity comprises a containment device.

9(previously presented). The method according to Claim 4 wherein the ratio of the first component to the second component ranges from about 1:1 to about 3:1 .

10(previously presented). The method according to Claim 8 wherein the containment device comprises polyethylene, polyester, vinyl, ethylene vinyl acetate, nylon, ethylene vinyl acetate, styrene-isoprene-styrene, styrene-butadiene-styrene or other blocked copolymers, polybutadiene, polyamide, modified EVA's, modified polyethylene, modified polybutadiene, GMA, SBR or mixtures thereof.

11(previously presented). The method according to Claim 1 further comprising laminating at least a portion of the foam.

12(previously presented). A foam composite comprising a foam produced according to the method of Claim 1 which is at least partially laminated onto at least one member selected from the group consisting of polyethylene, polyester, vinyl, ethylene vinyl acetate, nylon, ethylene vinyl acetate, styrene-isoprene-styrene block copolymers, styrene-butadiene-styrene block copolymers, polybutadiene, polyamide, modified EVA's, modified polyethylene, modified polybutadiene, GMA, SBR or mixtures thereof.

13(previously presented). The foam composite of Claim 12 further comprising at least one of polyethylene or polystyrene powders.

14(previously presented). A foam precursor comprising:

- (a) an A-side foam precursor composition comprising at least one liquid epoxy compound, and at least one encapsulated blowing agent, and;
- (b) a B-side foam precursor composition comprising at least one carrier and at least one acid source comprising about 1 to about 30wt.% of phosphoric acid having less than about 5 weight percent water and wherein said B-side foam precursor has an acidic pH and the ratio of said A-side to said B-side ranges from about 1:1 to about 3:1 .

15(previously presented). The foam precursor according to Claim 14 wherein (a) further comprises at least one phenoxy resin.

16(previously presented). The foam precursor according to Claim 14 wherein said at least one carrier material comprises polyvinyl alcohol.

17(previously presented). The foam precursor of Claim 16 wherein said encapsulated blowing agent comprises at least one hydrocarbon.

18(original). The foam precursor of Claim 14 wherein the encapsulated blowing agent comprises a thermoplastic shell that contains a butane blowing agent.

19(original). The foam precursor of Claim 14 wherein at least one of the A-side precursor and the B-side precursor further comprises castor oil, at least one benzyl phthalate and at least one member selected from the group consisting of Bis A epoxy and Bis F epoxy.

20(previously presented). The foam precursor of Claim 14 wherein said epoxy compound comprises a bis-A or bis-F epoxy compound; the blowing agent comprises a butane blowing agent and the A-side precursor further comprises at least one member selected from the group consisting of polypropylene, polyethylene and polyvinyl alcohol.

21 (previously presented). A foam precursor comprising:

- (a) a A-side foam precursor composition comprising at least one [liquid] epoxy compound,
- (b) a B-side foam precursor composition comprising a combination comprising at least one polyol and at least one acid source comprising substantially water free phosphoric acid and wherein said B-side has an acidic pH; and
- (c) at least one encapsulated blowing agent combined with at least one of said A or B side precursor and wherein the ratio of A-side to B-side is about 1:1.

22(previously presented). The foam precursor of Claim 21 wherein said A side further comprises polyvinyl alcohol and at least one phenoxy resin.

23(previously presented). The method of Claim 9 wherein said static mixing head is affixed in a manner to seal a cavity into which the foam is dispensed.

24(previously presented). A method for producing a foam comprising:
combining at least one epoxy component, at least one acid source comprising phosphoric acid, and at least one encapsulated blowing agent under ambient conditions wherein during said combining an exothermic reaction occurs that is sufficient to expand the encapsulated blowing agent,
dispensing a foam.

25(previously presented). A method for producing a foam comprising:
combining an A-side foam precursor composition comprising at least one epoxy compound, a B-side foam precursor composition comprising at least one acid source comprising phosphoric acid and having an acidic pH, and at least one encapsulated blowing agent present in at least one of said A-side and B-side wherein the ratio of A-side to B-side is about 1:1 and wherein said combining is performed under ambient conditions and results in an exothermic reaction between at least one epoxy compound and said phosphoric acid that generates enough heat to expand said blowing agent during said combining, and
dispensing a foam.

26(previously presented). A method for producing a foam comprising:
providing an A-side foam precursor composition comprising at least one epoxy compound,

providing a B-side foam precursor composition comprising at least one acid source comprising phosphoric acid and having an acidic pH, wherein at least one encapsulated blowing agent is present in at least one of said A and B side foam precursors,

mixing the A-side and B-side foam precursors together wherein during said mixing an exothermic reaction occurs between said at least one epoxy compound and said phosphoric acid source and wherein the exothermic reaction generates an amount of heat sufficient to expand said encapsulated blowing agent,

using the heat to expand the blowing agent, and;

dispensing a foam.

27(previously presented). The foam precursor of Claim 21 wherein said at least one encapsulated blowing agent is combined with said B-side.

28(previously presented). A method for producing a foam comprising:
providing an A-side foam precursor composition comprising at least one epoxy compound,

providing a B-side foam precursor composition comprising phosphoric acid, at least one carrier and at least one encapsulated blowing agent,

mixing the A-side and B-side foam precursors together at a ratio of about 1:1 to about 3:1 wherein during said mixing an exothermic reaction occurs that generates an amount of heat sufficient to expand said encapsulated blowing agent,

using the heat to expand the blowing agent, and;

dispensing a foam.

29(previously presented). The method of Claim 28 wherein the ratio of A-side to B-side is about 1:1.

30(previously presented). The method of Claim 28 wherein the phosphoric acid contains less than about 5 percent water.

31(previously presented). The method of Claim 28 wherein the carrier comprises at least one polyol.

32(previously presented). The method of Claim 28 wherein said dispensing comprises dispensing the foam into an automotive cavity.

33(previously presented). The method of Claim 33 wherein the method is conducted at ambient conditions.

34(previously presented). The method of Claim 33 wherein said A-side further comprises at least one polyvinyl alcohol.

35(previously presented). A method for producing a foam comprising:
providing an A-side foam precursor composition comprising at least one epoxy functional compound,
providing a B-side foam precursor composition comprising phosphoric acid and wherein said B-side foam precursor has a pH of less than about 4.0 and is substantially free of water,
providing at least one encapsulated hydrocarbon blowing agent,
combining the A-side and B-side foam precursors and at least one encapsulated hydrocarbon blowing agent under conditions and concentrations sufficient to cause an exothermic reaction between said at least one epoxy functional compound and phosphoric acid that generates an amount of heat sufficient to expand said encapsulated hydrocarbon blowing agent and wherein the exothermic reaction time is less than about 100 seconds,
using the heat to expand the blowing agent to produce a foam.

36(previously presented). The method of Claim 35 wherein the conditions are sufficient to produce a foam having at least about 300 percent expansion.

37(previously presented). The method of Claim 35 further comprising dispensing the foam.

38(previously presented). The method of Claim 35 wherein the foam has a Shore A hardness of at least about 20.

39(previously presented). The method of Claim 35 wherein the reaction temperature of greater than about 270 F.

40(new). A method for producing a foam comprising:

providing an A-side foam precursor composition comprising at least one epoxy functional compound,

providing a B-side foam precursor composition comprising phosphoric acid and wherein said B-side foam precursor has an acidic pH,

providing at least one encapsulated hydrocarbon blowing agent,

combining the A-side and B-side foam precursors and at least one encapsulated hydrocarbon blowing agent in a mixing apparatus under ambient conditions and with concentrations sufficient to cause an exothermic reaction between said at least one epoxy functional compound and phosphoric acid during said combining wherein an amount of heat is generated by the exothermic reaction that is sufficient to expand said encapsulated hydrocarbon blowing agent and form a foam, and

dispensing the foam from the apparatus.

41(new). The method of Claim 40 further comprising continuing to expand the foam after said dispensing.